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A PRELIMINARY INVESTIGATION OF THE FOOD HABITS OF THE MOURNING DOVE IN ALABAMA [1]

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PURPOSE OF THE INVESTIGATION

The mourning dove (Zenaidura macroura), one of the most popular game birds in the South, is shot by hunters for food and sport during a part of the fall and winter. It is found in all sections of the United States and throughout practically all of Alabama. Because its northern populations migrate to the Southern States for the winter months, it is classified as a migratory bird. The investigation here reported was initiated for the purpose of obtaining information on the food habits of the bird in Alabama, which is essential to its proper management as a game bird. The field and laboratory work was carried on from June 1936 until December 1937. Stomachs were collected during the first 12 months of this period. This report is based chiefly on the results of stomach analyses, but it includes also field observations on feeding habits made as the specimens were collected.

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[1] Revised from material presented as thesis requirement for Master of Science degree, Alabama Polytechnic Institute, January 1938.

[2] Unit sponsored by Alabama Department of Conservation, Alabama Polytechnic Institute, American Wildlife Institute, and Bureau of Biological Survey.

DETERMINATIONS FROM STOMACH ANALYSES

Material Used

From June 1936 to June 1937, 250 mourning doves were collected in 36 of the 67 counties of Alabama for this study. The collection was random, with no attention paid to the size of the sample in relation to the bird population. The best collecting places were around feeding grounds or watering holes, where the birds were concentrated. A special effort was made to get specimens from large flocks in order to obtain data as to the foods that cause concentration. Examination of the stomachs was made in the Food Habits laboratory of the Biological Survey at Washington, D. C. In addition, data from the files of the Section of Food Habits on the analyses of 37 mourning dove stomachs collected in 1911 and 1912 were available, making a total of 287 stomachs used. Of these the number taken monthly ranged from 1 in June to 46 in April, the average being 24.

Vegetable Food

Data on the vegetable foods found in the 287 stomachs are given in tables 1 and 2, in which the arrangement for families is systematic and for species within each family alphabetic. Brief discussion is made of the families that averaged more than 1 percent of the annual food or that were seasonally important, as well as of plant debris and plant galls. Nomenclature for grasses is according to A. S. Hitchcock's Manual of the Grasses of the United States; for all other plants, according to J. K. Small's Manual of the Southeastern Flora, 1933 edition.

TABLE 1.--Plant families represented and the average annual percentage of each, by volume, in the food of 287 mourning doves in Alabama[1]

Plant family	Percent	Plant family	Percent
Pinaceae: Pine.............	1.88	Vitaceae: Grape.................	0.11
Gramineae (Poaceae): Grass.	55.60	Malvaceae: Mallow...............	.11
Cyperaceae: Sedge..........	2.45	Buettneriaceae: Chocolate.......	.12
Commelinaceae: Spiderwort..	2.79	Cistaceae: Rockrose.............	.02
Myricaceae: Bayberry.......	.08	Violaceae: Violet...............	(2/)
Polygonaceae: Buckwheat....	.01	Passifloraceae: Passionflower...	.24
Phytolaccaceae: Pokeweed...	.71	Epilobiaceae: Evening-primrose..	1.65
Alsinaceae: Chickweed......	2.35	Nyssaceae: Dogwood..............	.28
Ranunculaceae: Crowfoot....	.38	Convolvulaceae: Morning-glory...	.09
Magnoliaceae: Magnolia.....	.21	Solanaceae: Potato..............	.02
Brassicaceae: Mustard......	.02	Boraginaceae: Borage............	.01
Altingiaceae: Sweetgum.....	.01	Heliotropiaceae: Heliotrope.....	.01
Rosaceae: Rose.............	.10	Verbenaceae: Vervain............	.02
Malaceae: Apple............	(2/)	Lamiaceae: Mint.................	.02
Cassiaceae: Senna..........	.05	Pedaliaceae: Benne..............	1.20
Fabaceae: Pea..............	15.85	Rubiaceae: Madder...............	.05
Geraniaceae: Geranium......	2.61	Cucurbitaceae: Gourd............	.03
Oxalidaceae: Woodsorrel....	.18	Ambrosiaceae: Ragweed...........	1.59
Euphorbiaceae: Spurge......	5.96	Carduaceae: Thistle.............	.19
Aquifoliaceae: Holly.......	.04	Cichoriaceae: Chicory...........	.02
Frangulaceae: Buckthorn....	(2/)		

[1] In addition, plant debris comprised 2.73, plant galls 0.15, and stomach lining 0.06 percent of the stomach contents. [2] Trace.

TABLE 2.--Items that in any month averaged 1 percent or more by volume of the food of the mourning dove in Alabama

Food item	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
Stomachs used	18	13	31	46	41	1	20	13	33	6	35	30
PINACEAE (Pine family):	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Pinus taeda (loblolly pine)	.....	.....	5.45	.....	.....	.....	.....	.....	.....	.....	5.73	.....
Species unidentified	.....	7.94	1.31	.....	.....	.....	.....	.....	.....	.....	.....	.....
GRAMINEAE (POACEAE) (Grass family):												
Avena sativa (oats)	.....	.....	.....	.....	.....	.....	5.00	.....	.....	.....	.....	.....
Dactyloctenium aegyptium (crowfoot grass)	5.62	42.80	6.80	2.09	.....	.....	.....	.....	.....	.....	3.16	11.25
Digitaria sanguinalis (crabgrass)	4.88	.....	2.55	2.02	3.69	.....	.....	2.07	3.88	7.50	1.91	3.90
villosa (crabgrass)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.10
Echinochloa colonum (jungle-rice)	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.00	.....	.....
Eleusine indica (goosegrass)	.....	.....	.....	3.44	.....	.....	.....	.....	.....	.....	.....	.....
Hordeum vulgare (barley)	.....	.....	.....	1.02	.....	.....	.....	.....	.....	.....	.....	.....
Panicum capillare (panicum)	.....	.....	.....	.....	.....	.....	2.85	.....	.....	.....	.....	.....
lancearium (panicum)	.....	.....	.....	1.14	.....	.....	.....	.....	.....	.....	.....	.....
scoparium (panicum)	.....	.....	.....	2.02	.....	.....	.....	.....	.....	.....	.....	.....
texanum (Texas millet)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.41
Paspalum boscianum (bull paspalum)	52.97	8.63	4.42	2.46	3.44	.....	.....	24.50	6.99	18.80	5.95	16.50
floridanum (paspalum)	.....	.....	.....	.....	.....	.....	.....	.....	2.03	.....	.....	.....
setaceum (paspalum)	.....	.....	.....	1.00	.....	.....	.....	.....	.....	.....	.....	.....
Phalaris caroliniana (canary grass)	.....	.....	.....	.....	2.26	.....	.....	.....	.....	.....	.....	.....
Poa annua (annual bluegrass)	.....	.....	.....	15.30	.....	.....	.....	.....	.....	.....	.....	.....
Setaria lutescens (yellow bristlegrass)	.....	.....	.....	.....	.....	.....	2.00	.....	17.98	.....	.....	.....
Sorghum halepense (Johnson grass)	.....	.....	.....	1.77	[1]2.25	6.00	25.35	.....	8.82	.....	.....	.....
vulgare (sorghum)	.....	.....	.....	.....	[2]5.05	1.00	2.60	1.61	1.97	.....	.....	.....
Triticum aestivum (wheat)	.....	1.00	.....	2.25	3.74	35.00	12.75	13.70	23.15	.....	.....	.....
Zea mays (corn)	5.50	11.90	40.20	25.47	27.30	7.00	6.85	11.40	11.93	6.10	18.10	22.95
CYPERACEAE (Sedge family):												
Cyperus compressus (sweet rush)	.....	7.60	2.93	2.63	4.07	.....	.....	.....	.....	.....	.....	.....
Species unidentified	.....	8.00	.....	.....	1.76	.....	.....	.....	.....	.....	.....	.....
COMMELINACEAE (Spiderwort family):												
Commelina erecta (dayflower)	.....	.....	.....	.....	.....	.....	.....	.....	.....	28.10	.....	.....
Species unidentified	4.72	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
PHYTOLACCACEAE (Pokeweed family):												
Phytolacca americana (pokeweed)	5.44	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.08	.....
ALSINACEAE (Chickweed family):												
Alsine media (chickweed)	.....	.....	.....	4.59	1.65	22.00	.....	.....	.....	.....	.....	.....
RANUNCULACEAE (Crowfoot family):												
Ranunculus abortivus (buttercup)	.....	.....	.....	1.39	.....	1.00	.....	.....	.....	.....	.....	.....
recurvatus (buttercup)	.....	.....	.....	1.97	.....	.....	.....	.....	.....	.....	.....	.....
MAGNOLIACEAE (Magnolia family):												
Magnolia grandiflora (magnolia)	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.33	.....	.....
ROSACEAE (Rose family):												
Rubus sp. (blackberry)	.....	.....	.....	1.11	.....	.....	.....	.....	.....	.....	.....	.....
FABACEAE (Pea family):												
Arachis hypogaea (peanut)	13.85	.....	2.59	2.33	1.19	.....	.....	.....	.....	.....	21.26	13.14
Dolicholus minimus (rhynchosia)	.....	.....	1.13	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galactia sp. (milk pea)	1.44	.....	1.66	7.59	.....	.....	1.90	.....	.....	.....	.....	.....
Lespedeza striata (lespedeza)	.....	.....	10.91	.....	.....	.....	.....	.....	.....	.....	.....	.....
Strophostyles helvola (wild bean)	.....	7.38	3.73	.....	1.95	.....	.....	.....	.....	.....	.....	.....
Stylosanthes biflora (pencil flower)	.....	.....	.....	.....	.....	.....	.....	3.84	.....	.....	.....	.....
Vicia sativa (vetch)	.....	.....	.....	.....	1.68	.....	.....	.....	.....	.....	.....	.....
Vigna sinensis (cowpea)	.....	.....	3.55	1.49	1.70	14.00	7.30	6.50	4.00	6.80	13.80	22.70
GERANIACEAE (Geranium family):												
Geranium carolinianum (cranesbill)	.....	.....	.....	.....	18.10	7.00	4.40	1.61	.....	.....	.....	.....
OXALIDACEAE (Woodsorrel family):												
Oxalis sp. (woodsorrel)	.....	.....	.....	.....	2.12	.....	.....	.....	.....	.....	.....	.....
EUPHORBIACEAE (Spurge family):												
Acalypha ostryaefolia (three-seeded mercury)	.....	.....	.....	.....	.....	.....	.....	1.07	6.71	5.50	.....	.....
Bivonea stimulosa (tread-softly)	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.20	.....	.....
Chamaesyce hyssopifolia (*preslii*) (spurge)	.....	.....	.....	.....	.....	.....	.....	7.30	1.97	.....	.....	.....
Croton capitatus (doveweed)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.28
glandulosus (doveweed)	.....	.....	2.10	.....	1.24	.....	6.90	15.15	1.27	.....	.....	.....
monanthogynus (doveweed)	.....	.....	1.10	.....	.....	.....	2.55	.....	.....	.....	.....	.....
Tragia urens (tragia)	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.33	.....	.....
PASSIFLORACEAE (Passionflower family):												
Passiflora sp. (passionflower)	.....	2.69	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
EPILOBIACEAE (Evening-primrose family):												
Raimannia laciniata (evening-primrose)	.....	.....	3.45	.....	3.02	.....	5.70	7.30	.....	.....	.....	.....
NYSSACEAE (Dogwood family):												
Cynoxylon (*Cornus*) *floridum* (dogwood)	3.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
PEDALIACEAE (Benne family):												
Sesamum indicum (*orientale*) (benne)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14.45	.....
AMBROSIACEAE (Ragweed family):												
Ambrosia elatior (*artemisiifolia*) (ragweed)	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.00	1.37	1.13
Xanthium sp. (cocklebur)	.....	.....	.....	6.86	3.27	.....	.....	.....	.....	.....	.....	.....
CARDUACEAE (Thistle family):												
Dracopis amplexicaulis (coneflower)	.....	.....	.....	.....	.....	.....	2.15	.....	.....	.....	.....	.....
Plant debris	.....	.....	.....	1.00	3.71	7.00	7.30	.....	4.46	2.10	6.15	.....
Plant galls	.....	.....	.....	1.74	.....	.....	.....	.....	.....	.....	.....	.....
Total of all items, each of which averaged less than 1 percent monthly	2.43	2.06	6.12	7.32	6.81	.....	4.40	3.95	4.84	5.24	6.04	1.64

[1] Embryos.

[2] Embryos furnished 2.42 percent of this.

Pinaceae (1.88 percent).--Pine seeds were taken in every month of the year except June, August, September, and October, chiefly in winter and spring, and were present in 16 stomachs, forming only a trace of the food in 2 and from 1 to 100 percent in 14. They cannot be relied upon as a source of food, however, as most pines produce seeds but once in several years. Pine mast of 2 species (slash pine, Pinus caribaea, and loblolly pine, P. taeda) was identified. In order to be taken by the mourning dove the seeds must be on bare ground or else sprouting.

Gramineae (55.60 percent).--Of all the plant families, grasses were the most productive of dove foods. This is probably due to the wide availability of such cultivated crops as corn (Zea mays) wheat (Triticum aestivum), and Johnson grass (Sorghum halepense) and to the abundance of wild grasses in the open fields where doves prefer to feed.

Corn ranked first in the grass family, having furnished large percentages of the food each month. In fall and winter it was taken as waste, and in early spring, when there was a shortage of other seeds, it was picked up after livestock. Wheat was regularly eaten. Johnson grass, when left growing on terraces or when grown as hay, provided ideal food. Seeds of the cultivated sorghum (Sorghum vulgare) also were used, but they did not form as high food percentages as Johnson grass seeds, possibly because they are less palatable and because the plant usually occurs in small patches.

The most important native food plant was bull paspalum (Paspalum boscianum). This grass is found in nearly all cultivated fields and provides food during every month. It begins fruiting early in spring and continues until the first heavy frost in fall.

Next of the family in food importance was crowfoot grass (Dactyloctenium aegyptium). Its seeds, although small, attracted large flocks of doves to fields where the grass occurred in dense stands.

Crabgrass (Digitaria sanguinalis) was taken in every month except June. It is available throughout the year. Although never comprising as high a monthly percentage as crowfoot grass, it was more frequently taken.

Owing to its early fruiting, annual bluegrass (Poa annua) was next of the grasses in food value. One bird collected April 19 had about 17,200 seeds in its crop.

Seven species of Paspalum in addition to P. boscianum and nine kinds of Panicum each occurred in a quantity sufficient to be recorded as a percentage of the food. These and several other grasses recorded as traces may be of importance locally. The millets (Setaria spp.) may be of some value when grown as agricultural crops.

Cyperaceae (2.45 percent).--Sedge (sweet rush, bulrush, spikerush, chufa, nutgrass) seeds were found in the food in every month, with Cyperus forming a higher percentage than any other genus. Two species of this genus were identified--the sweet rushes C. compressus and C. strigosus. These and the nut rush Scleria ciliata occurred as larger percentages and more often as traces of the food than any other member of the family. C. compressus was present in the stomachs in every month except June and September and made up 70 percent of the meal of 1 bird collected March 16 near Letohatchie, with approximately 7,900 seeds; C. strigosus occurred as a trace in 3 stomachs in April; and S. ciliata formed a percentage of the food in March, April, May, October, November, and December and a trace in July and August. Other species of Cyperus were noted in stomachs in every month except March, June, August, and September.

The other genera of Cyperaceae identified were Stenophyllus, Eleocharis, Rynchospora, Carex, and Scirpus, all probably picked up near water holes.

Commelinaceae (2.79 percent).--In the spiderwort family the seeds of only one genus, Commelina, comprised more than 1 percent of the annual diet. Seeds of the dayflower C. erecta were taken in greatest quantities in October, and those of C. crispa formed a trace of the food in August.

Phytolaccaceae (0.71 percent).--In the pokeweed family the common pokeweed Phytolacca americana occurred as a percentage of the food in 8 of the 12 months and as a trace in 2 others, which would indicate that its seeds are available throughout the year. From observation, as well as from stomach analyses, it was found to have been used most during winter.

Alsinaceae (2.35 percent).--The common chickweed Alsine media, which occurs as a weed in nearly all of the cultivated ground in the State, was the only important member of the chickweed family found in the stomachs. It formed more than 1 percent of the food in April, May, and June, the season of its principal availability.

Fabaceae (15.85 percent).--In the pea, or legume, family the cultivated members were of most importance as food, cowpeas ranking first. The peanut was second in value in winter and would surely rank first in the southeastern section of the State, where it is the principal agricultural crop. In order to be available to the dove, the peanut must be out of the ground and have its hull removed. The simplest way to accomplish this is to turn hogs into the field. They will root the peanuts out of the ground, and some of the broken ones that fall from their mouths can be eaten by doves. A few whole peanuts were found in the stomachs. Next in importance were two genera of wild legumes, the wild beans (Strophostyles) and the milk peas (Galactia). They grow in thinly wooded areas in all sections of the State, sometimes forming such dense stands as to hinder walking. Under these conditions the plants must be removed to make the seeds available to doves. Lespedezas sometimes ranked high as food locally, and vetches were taken under suitable conditions.

Geraniaceae (2.61 percent).--Although it was only in spring and summer that geraniums, or cranesbills, were present in the stomachs in sufficient quantities to be recorded as percentages of the monthly food, they were very important in the diet. They bloom early in spring, and their seeds soon fall to the ground, which makes them readily available. In May, the wild cranesbill (Geranium carolinianum) was second only to corn in importance, and its seeds were found in 26 of the 41 crops collected, in quantities ranging from a trace to 96 percent of the food.

Euphorbiaceae (5.96 percent).--The spurge family ranked third in food importance, with Croton (doveweeds) surpassing the other genera. With the exception of C. monanthogynus, which produces only one seed in its capsule, doveweeds are large three-seeded plants. Seeds of C. glandulosus furnished a percentage of the food in 8 of the 12 months and in August, with 15.15 percent, ranked second only to bull paspalum. Although the three-seeded mercury (Acalypha ostryaefolia) did not form high monthly percentages, it apparently was welcome as food wherever found, and its seeds formed 82 percent of the meal of a dove collected in September. This plant grows in cultivated areas, thickets, and waste places in all the soil provinces of the State. Two genera, Chamaesyce and Euphorbia, were represented in a large number of stomachs but did not form large percentages in any month. Their seeds are small and usually occurred only as a trace of the food.

Passifloraceae (0.24 percent).--Although seeds of the passionflower, or maypop (Passiflora incarnata), composed only 0.24 percent of the annual and 2.69 percent of the February food, they may at times be an important dove food. The seeds cannot be taken until the fruit around them rots away leaving them exposed to dry. This decaying and drying takes a long time. Although the fruits are ripe late in summer and in fall, the seeds are not available in any quantity until late winter. They become of special value then, however, when most other seeds are gone.

Epilobiaceae (1.65 percent).--Seeds of a local evening-primrose (Raimannia laciniata) appeared in small quantities in stomachs collected in 9 months of the year.

Pedaliaceae (1.20 percent).--Seeds of cultivated benne (Sesamum indicum) were eaten whenever available on the ground after shattering from the pods. As they deteriorate rapidly on the ground, they were not taken over a long period. In November they formed 14.45 percent of the food.

Ambrosiaceae (1.59 percent).--Seeds of ragweed (Ambrosia elatior) were eaten in every month of the year except June, July, and August. They keep well on the ground and are taken so long as they are not plowed into the soil. Cockleburs occurred in 8 of the 87 stomachs collected in April and May, the season at which most of the land was cleanly cultivated and, as a result, food scarce. During this time the birds were found eating almost any seed available. The contents of 1 stomach consisted entirely of cockleburs, including part of the hard thorny outer coat.

Plant debris (2.73 percent).--The mourning dove eats a very small quantity of plant material other than seeds. Classified as plant debris were leaves, stems, and roots, and all unidentified seed material, such as seed-coat fragments. Although the percentage it formed of the annual diet seems high in relation to some of the other foods, it was low for each individual analysis.

Plant galls (0.15 percent).--Plant galls were eaten occasionally in small quantity but in general were of little importance. They formed 1.74 percent of the food in the April stomachs and made up 75 percent of the contents of one crop.

Animal Material

Animal items, which were negligible in the annual diet, were probably all taken accidentally. Gastropod (snail) and pelecypod (mussel) shells may have been taken as substitutes for gravel, and insects and insect eggs possibly were mistaken for seeds. Dove feathers occurred frequently as traces in the stomach contents.

Gravel or Grit

Gravel, grit, charcoal, or mica occurred in 55.5 percent of the stomachs, and in one nearly empty stomach 80 percent of the contents consisted of gravel. Apparently almost any kind of gravel or grit is acceptable. It is ultimately broken up into fine particles, which pass through the intestines.

FIELD OBSERVATIONS ON FEEDING HABITS

The first evidence of flocking to areas of food abundance was noted late in summer. In the latter part of August young birds that had not yet attained adult plumage began concentrating in places where there was an attractive food supply. At this time also they began to feed at more definite daily periods, namely early in the morning, as soon as it was light enough for them to see, and late in the afternoon.

During winter the doves were seen feeding at these two periods in larger numbers than at any other time. Concentrations seemed to be in proportion to the abundance of food. This dove is a strong flyer, capable of traveling long distances for food.

In spring the large flocks broke up, possibly owing to the lack of locally abundant food supplies, and the doves were seen feeding in smaller groups. How long large flocks would persist if sufficient food were available is not known. The writer observed one large flock feeding in a "hogged off" peanut field on March 16. There were approximately 900 doves in the field at 6 a.m., and probably many more came in to feed there during the day.

In summer the feeding periods were less regular. During the nesting season the male, who shared in incubating the eggs and attending the young while they were in the nest, fed when he was off duty. He usually occupied the nest from 8 or 9 o'clock in the morning until 4 or 5 in the afternoon, although sometimes the female relieved him for an hour at noon. The female usually fed at her leisure during the day. She occupied the nest continuously from 4 or 5 in the afternoon, when she relieved the male, until the next morning when he relieved her. After the young had left the nest the adults were seen feeding together most of the day.

Mourning dove damage to plots of pine seedlings was reported in April 1937 by the Horticultural Department of the Experiment Station at Auburn, Ala. Inspection of these plots showed that the birds were taking the cotyledons as soon as they appeared above the ground. This killed the plants, as they were still dependent on the cotyledons for food. A few stomachs were collected, and in one, pine cotyledons formed 37 percent of the contents. It was noted that after the small pines had reached a certain size the removal of the cotyledons did no apparent harm, hence the critical period for each seedling was not long. Because of irregularity in germination of the seeds, however, damage to the entire plots lasted for some time.

The relative availability of seeds, which contributed more than 99 percent of the food, seemed to determine their rank in utilization. For seeds to be taken readily and utilized to the fullest extent, they must ripen and shatter upon bare ground. The seeds of plants that were growing so thick that the birds could not walk among them were not used.

Water seemed to be necessary to the mourning dove, and numerous observations were made to determine when the watering holes are used and their best location. It was found that the doves usually watered after they were through feeding and that when there was a full moon they sometimes continued the process after sundown. The doves will travel long distances to find a suitable place to drink, especially when there is a water shortage. They were most attracted to water holes that had gently sloping banks, devoid of vegetation. This gave them easy access to the water, which they preferred to reach by alighting a short distance from its edge and walking up to it. They seemed to have no preference between running and still water.

SUMMARY

In the 287 mourning dove stomachs examined, 149 species of vegetable food representing 41 plant families were identified, all but 3 families providing food in quantities sufficient to be recorded as percentages of the bird's annual diet in Alabama.

More than 99 percent of the food consisted of seeds.

Animal food was insignificant and was probably taken accidentally.

The grasses were the most important family as a source of food, the cultivated varieties--corn, wheat, and Johnson grass--ranking first as a group. The most important single native food was bull paspalum (Paspalum boscianum). Crowfoot grass (Dactyloctenium aegyptium) and crabgrass (Digitaria sanguinalis) were also important.

Other plants of importance in the diet were pokeweed (Phytolacca americana), chickweed (Alsine media), wild legumes (Galactia and Strophostyles spp.), cowpeas (Vigna sinensis), lespedezas (Lespedeza spp.), doveweeds (Croton spp.), evening-primrose (Raimannia laciniata), and ragweeds (Ambrosia spp.).

A shortage of choice food apparently occurred in April and May.

Preferred feeding places were on bare ground in open situations.

The birds were found to concentrate around an abundant food supply.

Preferred drinking places were at "watering holes" that had gently sloping banks, devoid of vegetation.

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